

1 METHOD OF CONSTRUCTING A COMPOSITE IMAGE

3 FIELD

4 The field of the invention relates to the Internet and more specifically to  
5 method of constructing and transmitting images over the Internet.

7 BACKGROUND

8 Computer networks, in general, and the Internet, in specific, have become a  
9 vast resource of information. With the aid of a personal computer (PC) and web  
10 browser, a user may connect and retrieve information on virtually any subject  
11 matter.

12 Using the browser, a user can locate and access any of a number of search  
13 engines through the Internet. From the search engines, a webpage may be  
14 downloaded for the entry of search terms. Through the proper entry of search  
15 terms, any range of images and text may be located and downloaded to a user.

16 Once downloaded to a user, the user may review the information on-line or  
17 print it out. Alternatively, the user may store the information to disk.

18 While the information downloaded from the Internet is useful, it typically  
19 downloaded under a hypertext transport protocol (HTTP). While HTTP is useful  
20 for storing and printing, it is not particularly easy to manipulate and combine files.  
21 Other protocols, such as XML, are available, but have not been developed into  
22 useful applications. Accordingly, a need exists for applications which allow for the  
23 easy manipulation and combining of web based documents.

25 SUMMARY

26 A method and apparatus are provided for constructing a composite image  
27 within an image space of webpage. The method includes the steps of displaying  
28 plurality of source images within a content area of the webpage and dividing the  
29 image space of the composite image into a plurality of subspaces. The method  
30 further includes the steps of designating a subspace of the plurality of subspaces for

1 receipt of a selected image of the plurality of images and resizing the selected  
2 image to fit the designated subspace of the composite image.

3  
4 BRIEF DESCRIPTION OF THE DRAWINGS

5 FIG. 1 is a block diagram of a system for constructing a composite image in  
6 accordance with an illustrated embodiment of the invention;

7 FIG. 2 is login screen that may be used by the system of FIG. 1;

8 FIG. 3 is a subject matter selection screen that may be used by the system of  
9 FIG. 1;

10 FIG. 4 depicts a further subject matter selection screen that may be used by  
11 the system of FIG. 1;

12 FIG. 5 depicts a template selection screen that maybe used by the system of  
13 FIG. 1;

14 FIG. 6 depicts a selected template and content area that may be used by the  
15 system of FIG. 1;

16 FIG. 7 depicts a floating toolbar that may be used by the system of FIG. 1;

17 FIG. 8 depicts details of content selection that may be used by the system of  
18 FIG. 1;

19 FIG. 9 depicts further details of content selection that may be used by the  
20 system of FIG. 1;

21 FIG. 10 depicts content that may be used in the composite image by the  
22 system of FIG. 1;

23 FIG. 11 depicts details of construction of the composite image constructed  
24 by the system of FIG. 1;

25 FIG. 12 depicts details of image transfer to the composite image constructed  
26 by the system of FIG. 1;

27 FIG. 13 depicts details the composite image constructed by the system of  
28 FIG. 1;

29 FIG. 14 depicts details of text transfer to the composite image constructed  
30 by the system of FIG. 1;

1           FIG. 15 depicts details of creation of the composite image constructed by  
2   the system of FIG. 1;

3           FIG. 16 depicts a composite image constructed by the system of FIG. 1;  
4   and

5           FIG. 17 depicts a screen for editing composite images that may be used by  
6   the system of FIG. 1.

7           Appendix I depicts a DTD that may be used by the system of FIG. 1.

8           Appendix II depicts a composite image file that may be generated from the  
9   composite image of FIG. 17.

FIG. 15

1 DETAILED DESCRIPTION

2 FIG. 1 is a block diagram of a system 10, shown generally under an  
3 illustrated embodiment of the invention, for collecting, composing and transmitting  
4 images through the Internet. As used herein, an image includes: an illustration;  
5 photo; text; multimedia components such as, but not limited to, video, hypertext,  
6 etc.; and/or the like. A composite image includes more than one image.

7 Included within the system 10 may be an operators station 34. The  
8 operators station 34 may include a central processing unit (CPU) 12 with an  
9 appropriate web browser 32, a display 20 and keyboard 18. The operators station  
10 34 may also include a database 22 which may function as a source and also a  
11 destination of images.

12 The operators station 34 may include a connection to the Internet 14. Also  
13 coupled to the Internet 14 may be one or more servers (e.g., CPUs) 16, including  
14 websites 26 and databases 24. The servers 16 may also function as both a source  
15 and destination of images as described in more detail below.

16 Under the illustrated embodiment, an operator (not shown) working through  
17 the operators station 34 may access a website 26 and download a webpage 28  
18 containing the software constructs (e.g., a page building via browser (PBVB) tool  
19 30) for processing composite images. The PBVB tool 30 is a configurable tool,  
20 which brings page layout functionality to the Internet. Communication between the  
21 operators station 34 and website 26 for downloading of the PBVB tool 30 (and  
22 subsequent communication) may occur through the standard HTTP port 80 of the  
23 operators station 34.

24 As described in more detail below, the PBVB tool 30 provides a facility and  
25 an intuitive interface for placing content within a template. Since it may be  
26 retrieved from a website, it is inherently simple to access from remote locations and  
27 easy to install. Further, since the PBVB tool 30 may be downloaded from a  
28 common website of an organization, the organization may more easily enforce  
29 business rules through the use of embedded templates.

30 In general, the PBVB 30 may be written as a Java applet and run inside the  
31 browser 32. Providing the PBVB 30 as a Java applet allows PBVB 30 to be easily



1 image. A scroll bar 78 may be provided to access other choices of templates. In  
2 the example provided, the operator may select the lower template 76.

3 The templates may be divided into a number of boxes. Larger boxes may  
4 have smaller boxes inside. The smaller boxes may be text boxes and the larger  
5 boxes may be image boxes. For convenience text boxes may be shown with  
6 diagonal lines. However, this is for convenience only, in the sense that images may  
7 later be placed in text boxes and text placed in image boxes.

8 Upon selection of a template 76, the PBVB 30 may divide the display 80  
9 into a composing screen including first and second windows 82, 84 (FIG. 6). The  
10 first window 82 may be a content area for selecting source content for the  
11 composite image and the second window 84 displays the template within which the  
12 composite image is to be created. A floating toolbar 86 is also provided to facilitate  
13 creation of the composite image.

14 FIG. 7 provides further detail regarding the floating toolbar 86. As shown, a  
15 first icon 88 of a disk, allows the user to save the composite image. A second icon  
16 90 allows the user to print the composite image. Third and fourth curved arrows  
17 92, 94 allows the user to UNDO and REDO changes. A selection tool 96 is  
18 provided to select specific boxes of the template for insertion of content into the  
19 composite image. A text tool 98 is provided to edit text in specific boxes. Zoom-in  
20 and zoom-out boxes 100, 102 and a zoom-to-percentage box 104 are provided to  
21 enlarge or reduce portions of the composite image. A help box 106 is also  
22 provided. Finally, a box select tool 108 and line selection tool 107 are provided to  
23 insert additional boxes and lines into the template.

24 A user may click on the box selection tool 107 with a cursor 134 and then  
25 click on a desired location within the selected template. The location of the cursor  
26 134 when the key on the mouse was actuated becomes the upper left corner of a  
27 new box. The user may enlarge the box by holding the actuating key on a mouse  
28 controller and dragging the new box to whatever size needed.

29 Similarly, the line tool 107 may be selected by placing the cursor 134 on the  
30 line selection icon 107 and clicking. To create lines, the user may first click on a  
31 starting position, move the cursor 134 to an end position and click a second time.

1           The content area 82 functions as a means for accessing source material for  
2 inclusion into the composite image. Within the content area 82, a first pull-down  
3 menu 110 may specify a data path to a particular data source (e.g., within a local  
4 directory, related database 22, Internet source 24, etc.). Once a source has been  
5 identified, first and second tabs 112, 114 may be used to select either text or images  
6 within the source file.

7           In the catalog example, a user may specify a specific pathname as a data  
8 source within a remote DB 24 (FIG. 1). Files identified by the pathname may be  
9 displayed in the pulldown menu 118 (FIG. 8) of content select 110. In the catalog  
10 example, the file names may be "Specific Product", "Special Items" and "Sale".  
11 The user may select "Specific Product". Some choices may require additional path  
12 information.

13           For example, selection of the directory name "Specific Product" may not be  
14 a complete path to a file. In this case, a window 120 (FIG. 9) may be displayed  
15 requesting a specific file name. The user enters an identifier in a file identifier box  
16 122 and activates the OK button. The information entered through the file  
17 identifier box 122 may be easily customized via a configuration file.

18           Upon identification of a file, the contents of the file may be displayed in the  
19 content area 82. Since the image tab 112 is highlighted in the content area 82,  
20 images 128, 130, 132 within the file 11SKU#, 12345-1211 are retrieved and  
21 displayed within the content display area 126. To accommodate the reduced size of  
22 the content display area 126, the images may be reduced or enlarged using standard  
23 Java commands. Alternately, a thumbnail image may be displayed which may be  
24 suggestive of the underlying image.

25           To create the composite image, the user may place a cursor 134 on an image  
26 (e.g., 128) and drag the image to a box (e.g., 136). When the cursor 134 is released,  
27 the 10 PBVB 30 resizes the image 128 to occupy the box 136 using standard Java  
28 commands. The outline of the box 136 disappears and the resized image 138  
29 appears in its place (FIG. 11).

30           Since the image 138 was placed in a first box 136 of the larger box 142, the  
31 PBVB 30 may now assume that the second smaller box 140 is a text box. To select

1 text to add to the composite image, the user may either click on the box 140 or  
2 select the text tab 114.

3 Selection of the text tab 114 (FIG. 12) causes any text sections 142, 144,  
4 146 associated with the file to be presented in the content area 82. As with images,  
5 the user may place the cursor 134 over a text section and drag the text (e.g., 144) to  
6 a box (e.g., 140). Alternatively, the user may first click on the box 140 and then  
7 simply click on the text section 144 to affect a transfer. As with the images, the  
8 text section 144 may be resized to fit the box of the composite image (FIG. 13).

9 Once text has been dragged to a box the user may edit the text.  
10 Alternatively, the user may edit the text 144 file in the control area 82. The user  
11 may edit the text by selecting the text tool 98 or he may select the text by double-  
12 clicking on the text. Once the text tool has been selected, the user may place the  
13 cursor 134 in the proper location in the text and make any necessary changes.

14 To facilitate entry of information into the composite image 148, the user  
15 may select the zoom-in tool 150 (FIG. 14) and enlarge a particular box 152. In  
16 response, the box 152 (FIG. 15) may be enlarged to occupy the entire right window.  
17 Image and text may be dragged and dropped as above. As each box 152 (FIG. 15)  
18 is completed, the user may return to the template by selecting the zoom-out tool  
19 100.

20 Using the process described above, the entire composite image 148 may be  
21 completed as shown in FIG. 16. Upon completion, the user may select the save  
22 icon.  
23 Upon selection of the save icon 88, the composite image 148 may be converted into  
24 an XML document and stored or printed. The XML document may be stored in a  
25 local database 22, transmitted under XML to a website 26 or stored in a remote  
26 database 24.

27 The transfer of data into and out of the PBVB 30 may be accomplished  
28 under any of a number of different formats. The source information (text and  
29 images) provided to the PBVB 30 may be provided under any appropriate mark-up  
30 language (e.g., XML) from any of a number of information conversion utilities



(e.g., DeskNet APS). Images may be further encoded under an appropriate image format (e.g., gif, jpeg, etc.).

Composite images may be encoded by PBVB 30 into a composite image file 21, 29 under a webpage format for transmission, printing or storage in an appropriate database under a mark-up language structured to minimize composite file size, yet maximize file conversion efficiency. Appendix I provides an example of a document type definition (DTD) that may be used in conjunction with XML as an encoding mechanism for the composite image.

As may be noted from the DTD information of Appendix I, the information of the composite image maybe encoded under XML based upon position and any of a number of text and picture elements. The x position (xpos), y position (ypos) and width and height of each box of the original template of the composite image 148 is required. Text may be attached to text boxes using conventional XML formatting. Lines, font or shading may be imparted to the composite image 148 using the DTD and conventional XML formatting.

As may also be noted from the Appendix I the DTD allows images or text to be identified by a universal resource locator (URL). The utility of using a URL for an image (or for text) is that the actual image does not necessarily have to be stored within the composite image file. As such, the composite image file 21, 29 may simply be transferred in the form of a shell with references to source files. When the composite file reaches its destination, a browser may simply retrieve the information from the URL and insert it into the proper location of the composite image 148.

As is clear from Appendix I, the composite image file 21, 29 may be structured without any text or image information within the file. The composite image file 21, 29, in fact, need only contain a page layout with paths to the image and text necessary for rendering the composite image into the same visual appearance presented to the original user during creation of the composite image.

Within a destination (e.g., another CPU 16), the composite image 148 may be reconstructed based upon the composite image file 29 and the DTD 27. To recreate the composite image 148, a decoding processor 23 (e.g., a browser) may

1 retrieve the composite image file 29 from a database 24. The decoding processor  
2 23 may reconstruct the template using the composite image file 29 and DTD 27.  
3 Any images not contained within the file 29 may be retrieved using the URL within  
4 the composite image file 29.

5 FIG. 17 depicts an editing screen that may be generated by the PBVB tool  
6 30 for editing composite screens. As with the composing screen of FIG. 6, the  
7 editing screen may include a content area 82 and an image area 84.

8 To facilitate editing of existing (or the generation of entirely new)  
9 composite images, the content area 82 may include tabs allowing selection of  
10 images, text or templates. In the case of the editing screen of FIG. 17, the template  
11 tab 160 may be used to retrieve pre-existing composite images.

12 By selecting the template tag (and entry of an appropriate path identifier), a  
13 number of previously created composite images 162, 164, 166 may be displayed in  
14 the context area 82. To select a composite image 162, 164, 166, the user may place  
15 the cursor over the image and activate the selection switch.

16 In response, the selected composite image 162, 164, 166 may be displayed  
17 in the image area 84. Once an image has been selected, the user may select the  
18 image or text tab (FIG. 18) and edit the selected composite image. Editing may  
19 occur by selecting the text tool and typing in corrections, add new boxes, change  
20 box size (all as described above), or substitute new content. New content may be  
21 substituted by dragging new content into the space of existing content. When this  
22 is done, the new content completely replaces the old content.

23 Turning now to the composite images, an example will now be provided  
24 regarding the structure and content of the composite image files 21, 29. Appendix  
25 II may be representative of a CEF file 21, 29 that may be generated by the PBVB  
26 tool 30 from the composite image 168 of FIG. 17.

27 For ease of understanding the content of Appendix II, line numbers have  
28 been added along the left margin of FIG. 17. Reference shall be made to the line  
29 numbers as appropriate to understanding the relationship between CEF files  
30 elements and corresponding elements of the composite image 168.

1 As may be noted, line 1 defines the type of CEF 21, 29 file by version and  
2 the term "encoding="latin1" defines an XML character set. Line 3 provides a URL  
3 to a relevant DTD 27, 31. Line 5 provides a layout delimiter. Line 6 provides a  
4 page number of the composite image and a size of the page in points (e.g., 72 points  
5 per inch).

6 Lines 7-18 defines the first element 170 of the composite image 168. As  
7 shown on line 7, the element 170 is a text box. The x and y position (i.e., xpos and  
8 ypos) of the upper left corner of the box lies at 225 and 643.252, respectively. The  
9 width is 365.7266 and the height is 21.2385 points. The box can be edited,  
10 therefore canEdit="true". The term xpos=0, therefore other boxes may overlap the  
11 first element 170. The runaround terms (e.g., runaroundleft, runaroundright,  
12 runaroundtop, runaroundbottom) specify a border space around the element 170.  
13 Line 12 defines the end of the text properties. Lines 13-15 specify font and style.  
14 Lines 16-17 specifies the actual text to be placed within the element 170. Line 18  
15 defines the end of the text element 170.

16 Lines 20-27 defines the location and content of a picture box 172. As may  
17 be noted, line 26 provides a URL to the actual image information to be inserted into  
18 the picture box 172.

19 Similarly, lines 28-35 defines image element 196 and lines 36-47 defines  
20 text box 182. Line 48 to the end of page 1 and lines 1-6 on page 2 of Appendix II  
21 define text box 184. Lines 8-19 defines empty box 178, lines 20-27 defines image  
22 element 174 and lines 28-35 defines picture box 180.

23 Line 36 to the end of page 2 and lines 1-9 of page 3 of Appendix II defines  
24 the location and content of large text box 188. Lines 10-21 defines text box 188,  
25 lines 22-33 defines text box 190, lines 34-45 defines text box 192. Line 42 to the  
26 end of page 2 and lines 1-11 on page 4 defines text box 186.

27 It should be noted that elements 172 and 174 have a lower zpos value than  
28 elements 188. The lower zpos values of elements 172 and 174 identify these  
29 elements as lying on top of (instead of underneath) element 188.

30 A specific embodiment of a method and apparatus for constructing  
31 composite images according to the present invention has been described for the

